MACHINA EX DEUS

by

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This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Fine Arts.

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ABSTRACT

MACHINA EX DEUS

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This is a supplementary text that cannot be considered separately from the exhibition, “Machina ex Deus”. Here are the thoroughly investigated concepts of machine, the Machina, and the mutual evolution of man and the machine. First, the manifestation on the “Machina ex Deus” presented; and then the exhibits are discussed in terms of design and development processes, application, material, relations to one another, and presentation.

Key Words: Machines, human, civilization, evolution.

ÖZ

MACHINA EX DEUS

Numan Kahveci

Görsel Sanatlar ve Görsel İletişim Tasarımı Yüksek Lisans Programı

Tez Yöneticisi: Selim Birsel

Ocak 2007, vii+62 sayfa

Bu metin, “Machina ex Deus” sergisini destekleyici bir çalışma olup, sergiden ayrı değerlendirilemez. Burada incelenmiş olan kavramlar; makine, Machina, insanla makinenin karşılıklı evrimleridir. Öncelikle “Machina ex Deus” sergisinin manifestosu anlatılmış olup, ardından sergilenmekte olan işler; tasarım ve geliştirme süreçleri, uygulama, kullanılan malzemeler, işlerin birbirleriyle olan ilişkileri ve sunumları açısından tartışılmıştır.

Anahtar sözcükler: Makine, insan, uygarlık, evrim.

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INTRODUCTION

Two paper craft sculptures, a vector graphics illustration, a collage, and a hybrid work (which consists of a watercolor painting, and a projection of a computer generated 3d image of the same portrait) are selected and displayed in the exhibition.

The aim of this text is to show major issues concerning my exhibition and create a survey of my experience at Sabanci University Visual Arts and Visual Communication Design graduate program.

At the very center of my decision to attend Sabanci University Visual Arts and Visual Communication Design graduate program, lies my undergraduate education in mechatronics engineering. Briefly, mechatronics deals with three major areas: mechanics, electronics, and computation. My undergraduate study was based upon developing robots that replace people by imitating and improving human functions. This process of replacement is called “automation”. During my senior year, one of my projects was to design automatic fabric labeler for a major shirt company. As a part of the project, I went to the shirt factory to observe the labeling process. The labelers were working amazingly fast, possibly 3 times faster than the best machine that I could design. Ironically, those people were more automated, and machine like than any machine I have ever seen. Eventually, the labeling machine was built to substitute the labor force of the working people. This incident, led me to question my relation to the machines, how people can turn into machines, and more importantly, what the Machina is.

The exhibition “Machina ex Deus” is the product of the mutual relation between man and machine. The exhibition is an attempt to understand the history and nature of the mutual relation; and to point out possible issues that may occur in the future, due to the mismatch between the speeds of evolutions of these two bounded being. Although, the exhibition and this paper are fed from scientific issues, the aim of this text is not to make a scientific statement, but to make an argument about the issues that concerns the exhibition. In the first chapter (The Machina), mutual evolution of man and machine and some of its consequences are discussed. In the second chapter (The Process and the Works) debates the creation process, the works, and their connection with the issues argued in the first chapter.

THE MACHINA

What is a machine? The common definition of machine is ‘mechanical devices or hardware’. According to Wikipedia, the scientific definition is “…any device that transmits or modifies energy.” The first definition reduces the meaning to a class of physical objects, while, according to the second one almost everything in the universe is a machine. However, neither of these definitions is able to cover the concept of machine that the exhibition Machina ex Deus is based on. Machine is an evolving product of human intellect, so it is neither a separate entity nor a specie. It is the mutual counterpart and the new substance of the human evolution. Thus, to differentiate this meaning from the other two definitions, I will use the word “machina”, as in the Latin phrase “deus ex

machina"[1] because machine is an unexpected character that changed the course of human evolution.

The proto-machines, such as stone tools, were used by hominids long before the arrival of Homo sapiens.[2] The lack of sharp teeth and claws of hominin species were superseded by the proto-machines. Hence, the survival of our ancestors the arrival of Homo sapiens was dependent on use of these proto-machines as body extensions. With "the Great Leap Forward"[3], the system of creating tools changed. From this point on, the needs of human has started to exceed the needs of survival in the nature. For example, a burial ceremony is not required to survive in the nature but it is required culturally. Thereby, civilization and culture has taken shape, and man has started to isolate himself from the nature. The man's detachment from the nature also causes a shift in man's habitat from nature to cities. This new habitat demands from its settlers another form of evolution, an intellectual one. Thus, the substance of human evolution has been shifted from biological to intellectual, cultural and scientific, and the machina is the counterpart of this evolution. By evolving the machine

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[1] Deus ex machina is a Latin phrase that is used to describe an unexpected, artificial, or improbable character, device, or event introduced suddenly in a work of fiction or drama to resolve a situation or untangle a plot (e.g., having the protagonist wake up and realize it was all a dream, or an angel suddenly appearing to solve problems). (from Wikipedia)
http://en.wikipedia.org/wiki/Deus_ex_machina (01.02.2007)

[2] Stone tools are first attested around 2.6 million years ago by Homo habilis.
http://en.wikipedia.org/wiki/Human_evolution (01.02.2007)

[3] The *Leap Forward* is a time period that human culture apparently started to change at much greater speed: "modern" humans started to bury their dead carefully, made clothing out of hides, developed sophisticated hunting techniques (such as pitfall traps, or driving animals to fall off cliffs), and made cave paintings about 50000 years ago. This speed-up of cultural change seems connected with the arrival of modern humans, *Homo sapiens sapiens*. Additionally, human culture began to become more advanced, in that; different populations of humans begin to create novelty in existing technologies.
http://en.wikipedia.org/wiki/Human_evolution (01.02.2007)

Unlike us, the nature is very patient with changing itself. The evolution of species is an extremely slow process. For instance, the time span between the first hominid, Homo habilis, and Homo Sapiens is about 2.25 million years.[4] On the other hand, the evolution of human civilization and the machina is incredibly faster. 10,000 years ago, man was hunter and gatherer; 4500 years ago man was able to build the Great Pyramid of Giza; 109 years ago man flew in the sky; 40 years ago man had enough nuclear weapons to kill every single life form on the surface of the Earth; and now man has changed the climate of the Earth. Since human body has not changed significantly from "the Great Leap", the domination of man over the nature is the consequence of evolution of the machina. Moreover, the machina affects the biological evolution of man. For example, until insulin became medically available in 1921, diabetics were not able to pass their genes to the next generations due to their early deaths.[5] However, the affect of the machina over the functionality of human has much more significant consequences.

Until the arrival of the machina, the evolution of every living form was under the control of nature. Every species' evolution is determined by its habitat. Since mankind shifted its habitat from nature to cities, the human evolution changed its substance. Structure of cities is tied upon the evolution of machina, in fact, a city can be considered as a huge machine. Hence, the new habitat of mankind diversifies itself rapidly. The speed of natural evolution cannot match with our demands in cities, so we willingly alter our bodily functions with the machina, which leads the mankind to become the mere

[4] http://en.wikipedia.org/wiki/Human_evolution (01.02.2007)
[5] http://en.wikipedia.org/wiki/Insulin#As_a_medication (01.02.2007)

operators of the machina. Since the tasks appointed to our bodies are not determined by the nature but by the machina, human body can be considered as a completed anatomical entity, and this completed entity provides a basis for machina. In other words, people do not have to change their anatomy to adapt to their habitat, but rather extend their body by utilizing the machina. For instance, we are using lamps to obtain sufficient light in order to see in dark environments, instead of evolving our eyes. However, during the integration with the machina, we are tended to keep the anatomical totality of body, while changing the functionality of it. We always preserve our body, and never temporarily attach any external objects to it in order to improve it, except in case of a physical disability such as loss of a leg, and in case of ornamentation such as body piercing. Unlike Stelarc claims that human body is obsolete and its capabilities should be extended by physically integrating robotic parts[6], human body is a perfect and complete entity that integrates with the machina functionally rather than physically. Thus, by teaching our body to operate machines, we unify with the machina. The Industrial Revolution, due to its role of widespread of machinery, is the milestone of the unification. The use of the machina as well as the functional mutation, has gradually extended from industrial production to our daily lives by consumer goods, household objects and alike. Thus, the mutation of bodily functions has reached a wider spectrum, and new tasks are appointed to body parts unrelated to their original functions. For instance, the primary purpose of foot is walking. However, with the invention of automobile, the purpose of foot is altered to control the speed of the vehicle. Among these functional mutations, the right forefinger

[6] **Stelarc** is an Australian performance artist whose works focus heavily on futurism and extending the capabilities of the human body. As such, most of his pieces are centered on his concept that *the human body is obsolete*.
http://en.wikipedia.org/wiki/Stelarc (01.02.2007)

has the most important role of all, because of its job of pushing buttons, such as clicking mouse, because it is the major operator of the machines that we use.
Alan Turing, who is regarded as the father of modern computer science, formulated the Turing Machine which is extremely basic symbol manipulating device,

With the foundation of binary logic and the invention of electronics the machine acquired a mind that is different than ours. The binary logic is built upon the principle of bivalence. According to the principle of bivalence, any proposition is either true or false. In other words any proposition is either equal to 1 or 0, so any intermediate values do not exist. For instance, if there is a half eaten cookie in the jar, the machina perceives it as there are no cookies at all. By adding multiple propositions in array, a machine is capable of interpreting the between values. A computer perceives the half eaten cookie in two questions.

Is there a cookie in the jar? -> No

Isn't there a cookie in the jar? ->No

Then there is a half eaten cookie in the jar.

Hence, the mind of the machina is unable to interpret any matter until it converts it into fragments in a hierarchical order. Its ability of interpretation increases with the higher number of propositions. According to Walter Mayerstein, "the universe can be simulated as an enormous string of 0's and 1's."[7] However, his idea conflicts with "the uncertainty

[7] The Mind of God, The Scientific Basis for a Rational World, Paul Davies p. 80

principle"[8] and the nature. Despite the continuity (analog) of nature, the machina is discrete (digital). Thus, regardless of the number of propositions, there is always a gap that the machina misses to encompass. In digital photography quality of the image cannot exceed the number of the pixels and the number of colors. Since nature does not have any pixels and have infinite number of colors the digital image can never be able to imitate the nature. Consequently, despite their practicality, any machine works according to the principle of bivalence is imperfect and degrades the reality.

The structure of an artificial mind or any object that is based on the artificial mind is composed of subdivisions, paths and functions. Each logic subdivision has a single function, and is connected to other subunits via data paths. The data paths create a hierarchy among the subunits, and the hierarchy between subunits forms a bigger subunit, and this process continues until it bodies the total entity. Every subunit can connect limited number of subunits (generally one), and is not able to understand its part in the system. For instance, a circuit in a computer has a function of multiplying values that comes from the circuit A and the Circuit B, and transferring the multiplication to the Circuit C. It does not have any information about where those data come from and go to.

Today, we apply the array structure of the artificial mind in every aspect of our lives. In an assembly line, every laborer has a particular function. His function is linked to only two people, the laborer before him, and the one after him. His is expected to fulfill his task in a particular amount of time, which is the speed of the assembly line, and

[8] In quantum physics, the Heisenberg uncertainty principle is a mathematical limit on the accuracy with which it is possible to measure everything there is to know about a physical system. http://en.wikipedia.org/wiki/Uncertainty_principle (01.02.2007)

if he exceeds this particular time, either faster or slower, he fails his function. Thus the laborer functions as a machine. Furthermore, if there is a machine that is able to do the same task, he is replaced immediately. The companies are organized in the same manner, just like a machine. Within the hierarchical formation, people work under very strict departments. The workstation that is widely accustomed to is the cubicle system. People working in cubicles serve under single or certain duties. Moreover, an office arranged in cubicles, both visually and its function-wise, resembles a computer chip, which creates an irony, since the people working among these cubicles are using computers to carry out all their duties. In order to control the computers, they command their hands new duties, which are not natural, or innate, such as the use of the mouse. It all comes down to these people being machine operators in a larger machine, dramatically losing all their individuality and individual identities as they become more and more mechanical.

By the widespread use of the Internet, cell phones and computers, countless numbers of people and systems are connected to a gigantic network. A person is connected to the network by identification number, bank account, credit card, phones, cell phones, home address, email address, Internet Protocol address and other forms of registration. Furthermore, security cameras in streets, banks and other buildings visually record our activities through the network. A record of our actions is transmitted and kept in the network. The bank accounts and credit cards are the substance of the central control of money. Although money is a paper banknote, a substantial matter, it has been transferred to the electronic platform as eMoney, losing its substantiality, joining the network. With the use of eMoney, all wealth, consuming habits, where the money is

spent in/at, are continuously recorded. Then again, this process goes beyond just recording, but wealth begins to be controlled by the machina. For instance, some banks reply customers at any time of day, who have applied for loan via SMS, in a process that takes no longer than a minute. What determines the customers' credibility in such short notice is not a human; rather, it is a computer program that stores the information of the loan applicants in its database. Telecommunication tools such as phones or e-mails track all the conversations made. As the frequency of the use of these tools increases in social relations, the records in the network increase. By means of signal-analysis sub-networks, such as ECHELON[9], integrated into the network, all telecommunication activities around the world are interpreted by the machina. However, cell phones have an additional property; the exact location of a cell phone can be determined. Since they are carried along everywhere all the time, users' exact positions are known by the network. Indeed, the network of the machina is not capable of monitoring and controlling everything in the present. However, the current capabilities of the network and the incredible speed of its evolution lead me to one conclusion: The machina will bit by bit [pun intended] outgrow itself, and its initial desired purpose, and will become a supreme being, controlling, tracking down, and recording the entire civilization. It will function with rewarding and punishing methods: as in the credibility in bank accounts, the record will reveal the truth whether it is a reward of a punish case. This is a reminder of doing good deeds versus committing sin. The only concept that therefore resembles the machina, by carrying the

[9] ECHELON is a name used to describe a highly secretive world-wide signals intelligence and analysis network run by UKUSA Community (comprised of intelligence agencies of five English-speaking nations), that has been reported by a number of sources including, in 2001, a committee of the European Parliament. According to some sources ECHELON can capture radio and satellite communications, telephone calls, faxes, e-mails and other data streams nearly anywhere in the world and includes computer automated analysis and sorting of intercepts.
http://en.wikipedia.org/wiki/ECHELON (01.02.2007)

same abilities is God. Unlike God's creation of Adam in his own image, mankind is creating the God Machine in his mind's image. Thus, this is the reason for me to name my exhibition the God Machine, Machina Ex Deus.

THE PROCESS AND THE WORKS

I attended Sabanci University VA/VCD graduate program to understand the essence and the ethical issues about man's relation with the machine. Before my master education started, I had both practice and theoretical knowledge of robotics, and participated 4 student exhibitions. Despite of these experiences, I was not able to combine these two distinct disciplines. More importantly, the reason of my desire to combine them was unclear. As dervishes seek for enlightenment thorough pain (çile çekmek in Turkish) in solidarity of a cell, I searched the meaning of the machina in the act of creation in my studio. I studied in precision and clockwork as an engineer, and in flexibility as an artist. My understanding of the machina and its relation with man is developed during the creation process of each one of my works. I questioned my purpose, my works, and their relation to the machina continuously within a process of endless trials with large variety of techniques and materials. The purpose of my endless trials was to master the theme of the exhibition rather than mentioning the theme. Consequently, the semiotics of the exhibition "Deus ex Machina" shaped with understanding by doing.

In the beginning of my graduate study at Sabanci University Visual Arts and Visual Communication Design program, my aim was to make art about machines. I was experienced in discipline of humanoid robots, and my primary thought was to build humanoid robots as sculptures. One of my first works is “the robot bug” which is able to walk in any surface. The idea behind “the robot bug” was to imitate a bug, which resembles machines at most among all other life forms. However, the idea of making robot sculptures was a poor idea in artistic sense. My previous thesis supervisor Erdağ Aksel convinced me that my project is more engineering than art. His suggestion to me was to work on simple and small mechanical objects like Marcel Duchamp’s kinetic art works. However, I was devoted the idea of making art about the machine rather than using machinery in my works. In kinetic art, machinery is the medium rather than the theme of art. On the other hand, my idea was to be functional instead of decorative. However, this decision pushed me to engineering, so I started to question art and machina. Thus, I cancelled the realization of the completed design of “the robot bug”.

Meanwhile, I was using several 3D programs for designing my works. I already had 4 years of experience in 3D graphics. However, realization of a 3D model is expensive and difficult. There are two possible engineering methods to produce the actual model from a 3D data; carving a metal block with Computer Numerical Control (CNC) machine, or printing it in 3 dimensions by using a fast prototyping machine. Both methods are expensive, and results are insufficiently precise. Then, I found a shareware named Pepakura that generates unfolded patterns from 3D data. By cutting and gluing these unfolded patterns, I got the exact replica of the original 3D models. Although paper

craft model are more attractive than those realized in CNC and fast prototyping machines, it requires much greater labor and time. The steps of realization of a paper craft sculpture are:

- Modeling the design in Maya
- Examining the model for non uniform polygons in the model and eliminating them
- Finding and correcting the polygons with reverse normals
- Defining every cut edges for unfolding the model in Pepakura
- Placing the unfolded patterns onto the paper for printing
- Cutting the unfolded pattern
- Scoring the edges and folding the edges
- Gluing

An average model consists of around 1500 faces and 6000 edges, so time required completing a paper craft sculpture (including 3d modeling) is approximately 2-3 months. If any mistake is made in one of the steps the whole work is lost. Furthermore, since the sculpture is made out of paper, it is fragile and cannot withstand its own mass, and collapses. I solved this problem by injecting large polyurethane foam inside the model.

The replication process with paper craft is not simply switching one form to another one. To understand the nature of this transition, we have to understand analog image and digital (or mechanical) image. An analog image keeps its continuity regardless of our distance from it. On the other hand a digital image cannot show this behavior. In other words, when we look at an apple closely it is still an apple, but if we look closely at

the digital image, we see small pixels, or polygons; hence, the apple has lost its totality. As I mentioned earlier, the machina has to divide a totality in order to understand it. However, human mind is not aware of this difference most of the time. My aim of using paper craft model as a replication of 3D graphics was to underline the discreteness of the mechanical images. Every computer generated 3D image is only a surface. Inside of the model is empty, so the 3 dimensions of the model is an illusion formed by 2 dimensions. By making the paper craft models with paper, which is as 2D material, this illusion is implied. Also, the surface of a 3D computer image is not continuous. It is the sum of smaller polygons, and each one of the polygons is defined by four-point with coordinates, and the relations between these points are defined by edges, which is also mathematical. As mentioned before, this formation is exactly the same with the structure of the mind of the machina. Polygons are the subdivisions, points have the function of defining the space, and edges define the hierarchy between them. However, in computer generated images, the tri-lateral formation of the machina is invisible. We perceive a 3D model as a total solid entity. On the other hand, the paper craft models in the exhibition expose their discreteness at first glance. Polygons, which form an angular surface, black edge lines, and alignment numbers, are clearly visible. Therefore, tri-lateral formation and the mathematical production procedure are presented.

Initially, I planned to build four caterpillars, each with different poses. I also built another one, which I cancelled due to its small size. However, I decided to avoid from repeating the same work four times because my point was made with one of them. The theme of “the caterpillar” is the transformation between nature and the machina. It is a

depiction of an organic form with mechanical techniques. I was inspired by caterpillar's metamorphosis; changing its biological structure, even in the cellular level, to become an entirely different creature. I felt there was a profound similarity between "the caterpillar's" metamorphosis and the human self-isolation from the state of nature. Also, I replaced caterpillar's dorsal structures, which is for camouflaging, with geometric structures like needles extruded from its back to imply its transition from organic to mechanic because I intended to imply the transition more than showing the actual caterpillar image. The size of the caterpillar is about as big as an average human in volume and it is hung low. Hence the audience sees himself/ herself neither smaller nor bigger than it, and he/ she can identify with it. Basically, a 3d computer file is a matrix that carries the information and coordinates of every point and edge, so the numbers in this matrix is the medium of the model. By displaying edges and numbers on "the caterpillar" sculpture, I intended to show the invisible medium of this sculpture.

The grasshopper is the complementary work of the caterpillar. Caterpillars experience the metamorphosis to become themselves. Thus, the grasshopper is the product, or the consequence of the previous work, in metamorphic sense. It is the product of the metamorphosis and its segmented anatomy, and armored skin resembles robots. The size of the grasshopper is dominantly bigger than human size, thus it domineers the audience in space, as the machina dominates us in evolutionary sense. Resembling working on a 3D document, from the computer to the printed, first designing and then actualization processes, is here the metamorphosis procedure. The caterpillar is like the

yet digital, unprocessed data. Then, the grasshopper is the actualized, “printed” as in the post-design process, outcome of that digital information.

“The sitting girl” was planned to be the theme of separate two works. My initial idea was to use the same pose twice in two different techniques, one painting and one 3d graphics, to separate natural and mechanical imagery. The watercolor and the 3d replica have been done by the same person, initiating from and imitating the same photograph, clarify their difference in technique. Therefore, I intended to make and raise by questioning the human perception. There are two reasons of my choice of painting instead of using photograph. The first one is that it is impossible to take a 3d data from a photograph directly. Any 3d model has to be modeled with hand by referencing photography. However much they resemble reality, they have been nurtured by artist’s interpretation. Therefore, a 3d model is more comparable with a painting rather than a photograph. The second reason is that photograph in the scale of the painting; I would have needed digital printing. That would have resulted in two digital materials in the comparison, and would have been shallower in the meanings. Before the final version, I painted a charcoal drawing which I decided not to display in the exhibition because I had for charcoal drawing in my undergraduate exhibitions. Hence, I decided to extend my limits instead of repeating myself. Watercolor painting, unlike oil and acrylic paintings, has more flexibility in richness of color and sharpness in edges, if can be applied properly. However, I did not have any experience in watercolor before. Thus, I painted a small version of the same scene for practicing the technique. Final version of “the sitting girl” is realistic and colorful. To be able to concentrate solely on the pose of the model, I

neglected the surroundings. The painting has a certain pose and an implied depth via the perspective effect of the tiles in the background. The reason to give it a three dimensionality is to differentiate the painting from the 3D. It is an analog image filtered by my eyes and painted by my hands, as all traditional paintings are.

On the other hand, the 3D replica of the same pose is brought into reality through completely different methods. Unlike the painting, which is painted directly from a single photograph, the very detailed 3D replica was first modeled as a standing figure in 3D. Then I applied several photographs of the girl as textures onto the model surface. Following this, I converted the standing posture of the model into the sitting pose in the painting. Initially, I was planning to produce the 3d model of “the sitting girl” in paper craft. Due to the enormous degradation of the colors and texture in printed version, which is caused by Pepakura, the paper craft modeling of this work lost its sense of reality. The result was unsatisfactory, and unrepairable due to Pepakura’s inability to print in higher quality. Consequently, I cancelled this work in the gluing stage. Then, in replacement of the paper craft model, I wrote an interactive program in Java Programming Language, which enables the audience to rotate the 3d model, projected onto the wall. It was required to reduce the number of the polygons in order to decrease the size of the 3d data file and make the file size compatible for Java Programming Language. The back of the model was cut out, in order to show the audience the inside of 3d images is empty. Thereby, I wanted to point out the illusion of 3 dimensions. However, the narration of the work and the visual quality (due to the reduction of file size) was poor. According to the comments of the members of the thesis jury, I decided to exclude this work from the

exhibition, too. Finally, instead of separating the painting and the 3d replica, I decided to merge them, as man and the machina are merged. This time I cancelled the texture of the 3d model and applied white color for preventing the color overlap between these merged items. Then, surface smoothness of the 3d model replaced with a rough surface. Therefore, the image rendered in Maya became visually closer to “the Caterpillar”, and a connection could be made. This digital image is the close up of the painting, starts with the head ends in the belly. It is projected into the wall of cubicles that made out of the panels in the gallery from the ground to the ceiling. Thus, this projection provides white light for the painting. The painting is hanged onto the same wall about 80 cm above the ground, and slightly to the left of the projection, where the light is brighter. When comparing the two works, the painting gives a warm, sincere feeling; whereas the model is cold and neutral.

Another cancelled work was “the projected eye” which was an interactive computer program projected onto wall. It was coded onto the same algorithm with the 3d projection of the girl. It is the all-seeing eye of the Machina ex Deus. It is a partly autonomous program. If there is no intervention by the audience, the eye looks around, examines its surroundings, and gathers information. The motion of the eyeball can be controlled by a mouse. When a member of the audience takes control of the mouse, the eye looks directly at that person as if it recognizes him or her. With the substitution of function mentioned earlier in this text, the member commands his or her hand to use the mouse. At this point, the mouse has a greater meaning. It is the median between the human and the computer. It is the closest 3D communication device between the two

parties of man and digital. What the hand directs via the mouse is transferred to the digital platform and is understood as digital commands by the computer –here the eye. After this initial eye connection, the member of the audience can rotate the eye 360 degrees to examine the eye. How he or she wishes to, and see the eye completely. I especially want the back of the eye to be seen, as it is never seen in real life. I have entered the word "Emeth" at the back, as based upon a story of Golem[10], representing the automated forms of so-called living, depicting the dilemma of life and death. However, this work did not compensate my expectations, and needed further developments. Due to shortness of time, I have postponed the developments for another exhibition.

Both "the RAM" and "the chip" is fed from the concept of mechanization of society. "The RAM" can be considered as the depiction of the shift of man's habitat from the nature to the cities. The documentary "Koyaanisqatsi: Life out of Balance"[11] inspired me to visualize the similarities of electronic circuits and cities. In the film, microchips and satellite images of metropolitan cities are juxtaposed, making an obvious comparison between their layouts. Meanwhile, I was researching the functional similarities of city and electronics by examining computer boards, reading data files of electronic chips and components from the internet and, and searching the functional similarities by using satellite images. After a long research, the profound functional similarities between a

[10] According to a Jewish narrative Golem (or Golem of Prague) brought to life by Rabbi Judah Loew from clay by some magical rituals. On his forehead, the word "emet", "aemaeth" or ,"emeth" (God's truth) is written. Killing Golem is possible by rubbing out the first, the meaning changes to the Hebrew word "met" or "maeth", meaning death.
http://en.wikipedia.org/wiki/Golem (03.02.2007)

[11] Koyaanisqatsi: Life out of Balance is a 1982 documentary film directed by Godfrey Reggio with music composed by minimalist composer Philip Glass and cinematography by Ron Fricke.

computer RAM (Random Access Memory)[12] and human residences are became visible. A computer RAM includes several microchips that are responsible to store data temporarily. Each microchip in the RAM consists of millions of transistor and capacitor to store data according arranged in rows and columns. The intersection of these rows and columns forms cells for data storage. A data is stored in a particular cell for a particular time until the CPU (Central Processing Unit) calls for data to fulfill its task. In modern city, the residence areas are arranged in a way that is almost identical to a RAM's architecture. Rectangular intersections of streets form a matrix that defines the house that people live in. A person is, like a data stored in the ram, stored in his home until he/she is called from his/her job to fulfill his particular function in the great machine of the city. "The RAM" is built upon an image of a RAM module by collaging the satellite images in Adobe Photoshop. Partial images are taken from Google Earth[13] to collage them in a way that mimics a RAM visually and functionally. The chips of the RAM are made by adding small fractions of satellite images of Brooklyn, and I used highways to as the data channels. For the green board that the chips and data channels are assembled on, the images of agricultural fields are used. In my airplane travels, I get the idea that the shape of the fields around a city is related to the city's level of industrialization. For instance, the fields around the Samsun Çarşamba airport, which is a rural area, are irregular. The fields are placed on the ground without any distinct shape or formation, so the image of those fields are harmonic with the nature. On the other hand, fields around the industrialized city of Munich have rectangular forms and aligned linearly. Therefore, the green board of "the RAM" is made out of perfectly rectangular fields. All images are

[12] http://www.howstuffworks.com/ram.htm (03.02.2007)

[13] A virtual globe program that maps the earth by superimposing satellite images.

collaged in a way that “the RAM” both forms an electronic circuit and uptown of a city, therefore the message of the work is clear.

Although the medium (vector graphics) of “the chip” is different than “the RAM”, it is the counterpart of “the RAM”. As mentioned before, “people are being machine operators in a larger machine, dramatically losing all their individuality and individual identities as they become more and more mechanical”. The theme of “the chip” is how people transformed into the subdivision of a machine. In the beginning, I draw an office cubicle with an employee. Then, its meaning had started to change, when I added seven more cubicles in a row. I added 24 more cubicles, a larger cubicle for the director, a printer room and a carboy to create an office floor. The organization and the hierarchy of the floor are similar to organization and hierarchy of an electronic chip. Each, cubicle in the floor is a single task unit that forms a bigger unit that has another task. Therefore, I drew a fourteen-legged chip, and placed the office floor on top of it. By adding those office-like chips, as an added the cubicles, in a row and assembling assembled an executive chip next to them; they formed a branch of a company. Finally, 24 branches are drawn, and connected to a central CEO chip.

CONCLUSION

My exhibition “Machina ex Deus” is a product of an endless experimental process with a large spectrum of materials and techniques. Every one of my works helped me to improve and change my understanding of the mutual evolution of man and machine. Through these experiments, I developed a perception and gave meaning to the mechanized life around me. I have been questioning the world we live in that is ever-increasingly digitalized, what its consequences might be, and where it might be leading us to. The exhibition is just a reflection of my personal thoughts on the topic, nothing is tried to be proved, or set in facts. I have created an evolutionary scene of my own upon history and scientific facts, where machines (which I call “the Machina”) and the living meet, transform in and out of each other, evolve, morph, contradict and create various hierarchies. However, the works displayed in the exhibition are not the answer to the evolutionary question which they created upon; instead, they are the survey and the final products of my graduate study in Sabanci University Visual Arts and Visual Communication Design program.

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Koyaanisqatsi: Life out of balance. Dir. Godfrey Reggio. DVD Videorecording. MGM, 1983.

Songs:

Pink Floyd. Welcome to the Machine, Wish You Were Here, (Track 02) Harvest, 1975

APPENDICIES

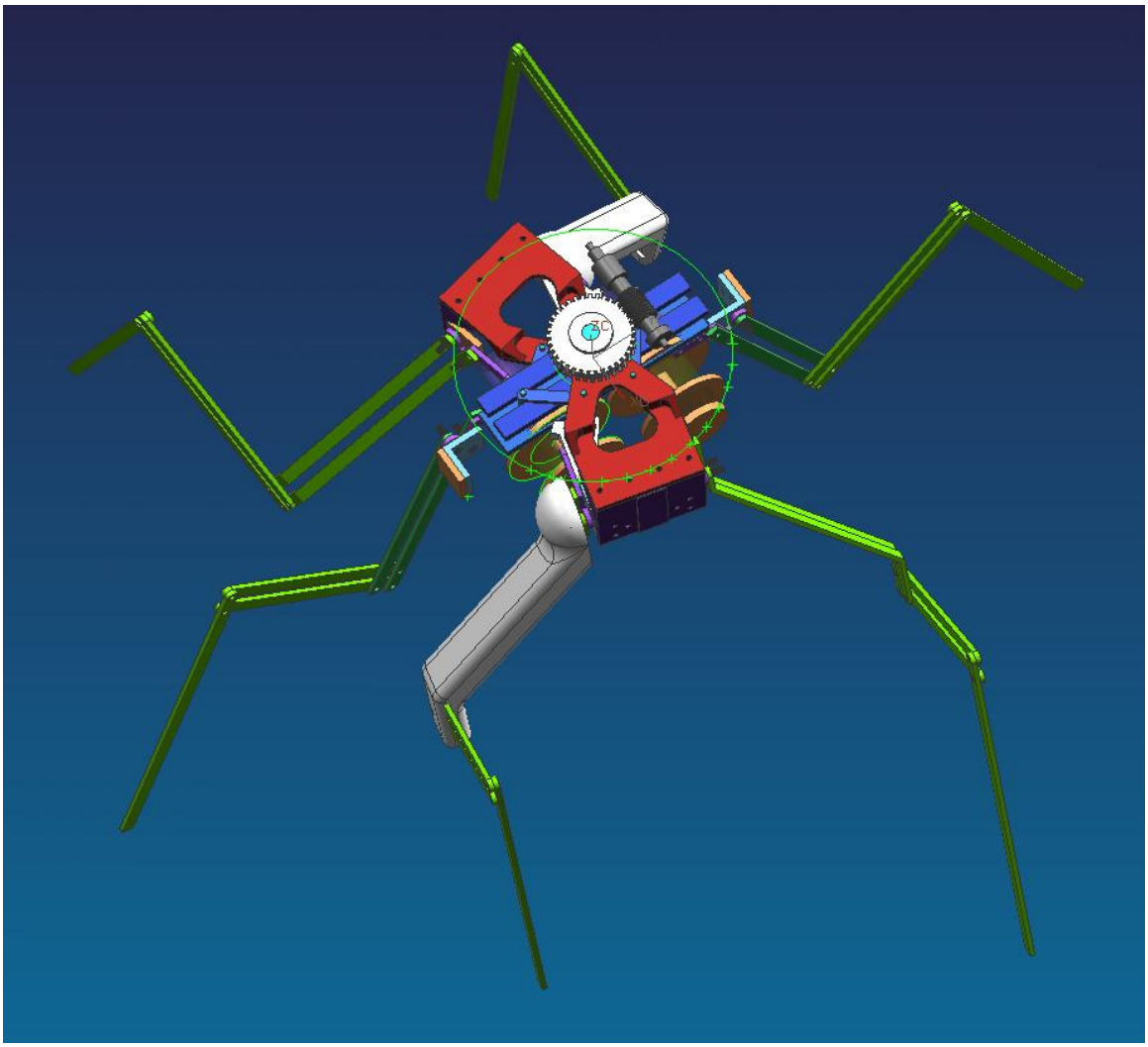

Figure 1 The Robot Bug, Computer Aided Design

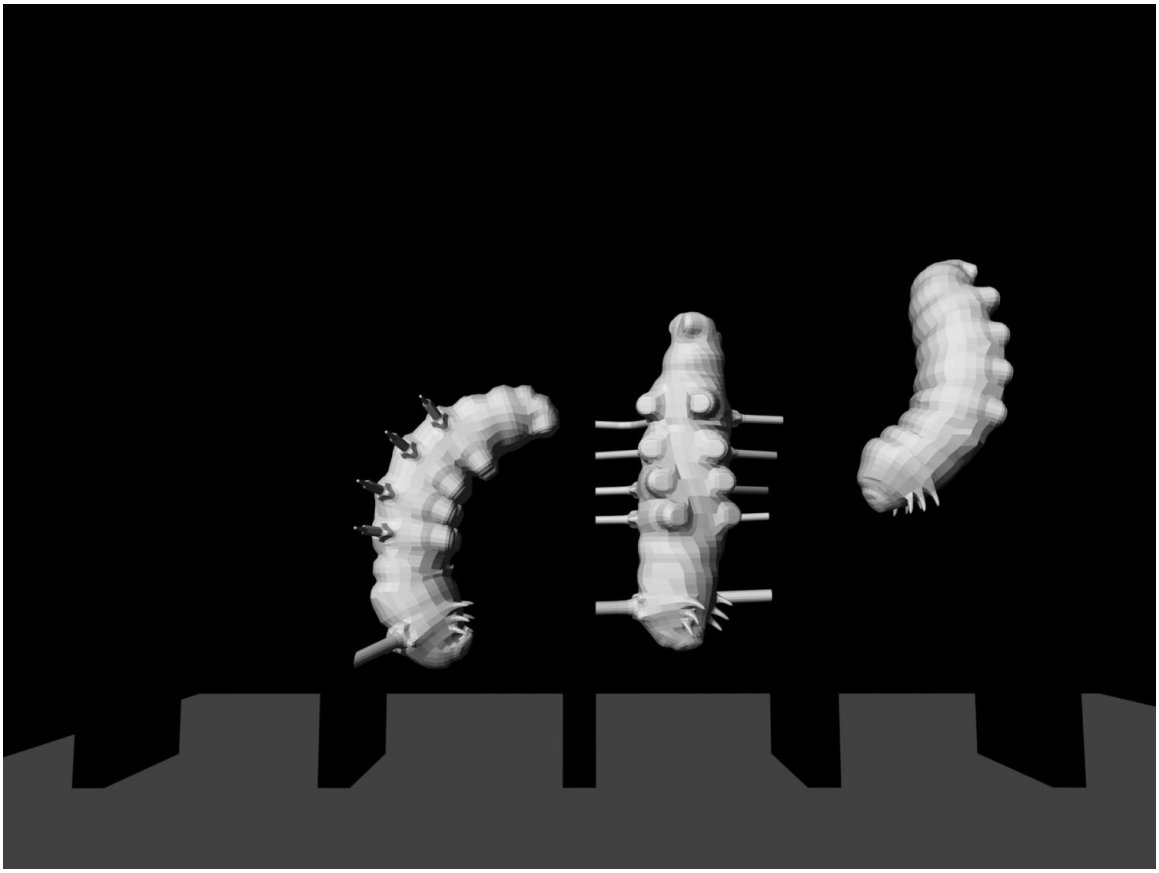

Figure 2 The Caterpillars, 3D design

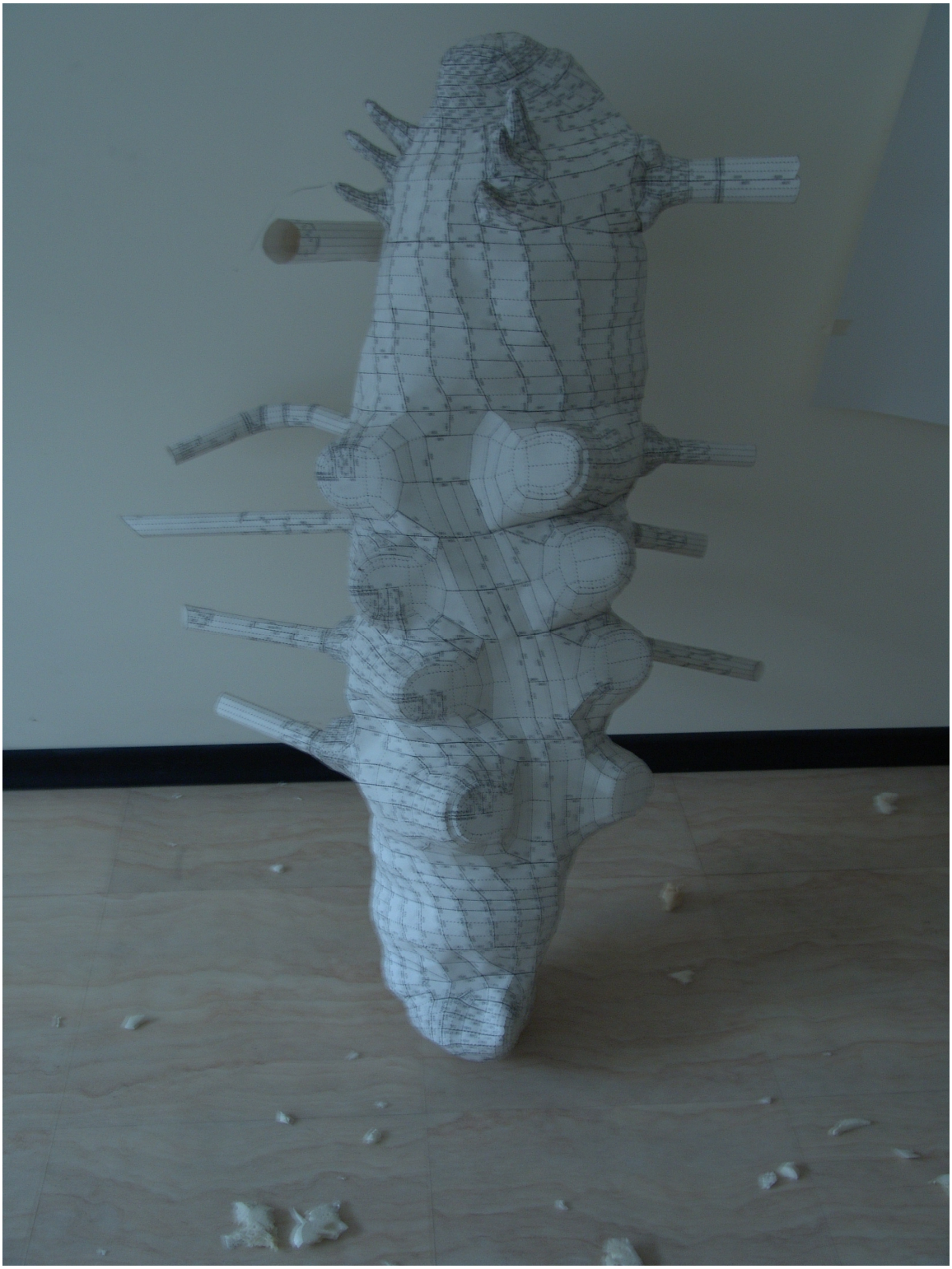

Figure 3 The Caterpillar (first version), Paper craft

Figure 4 The Caterpillar (second version), Paper Craft

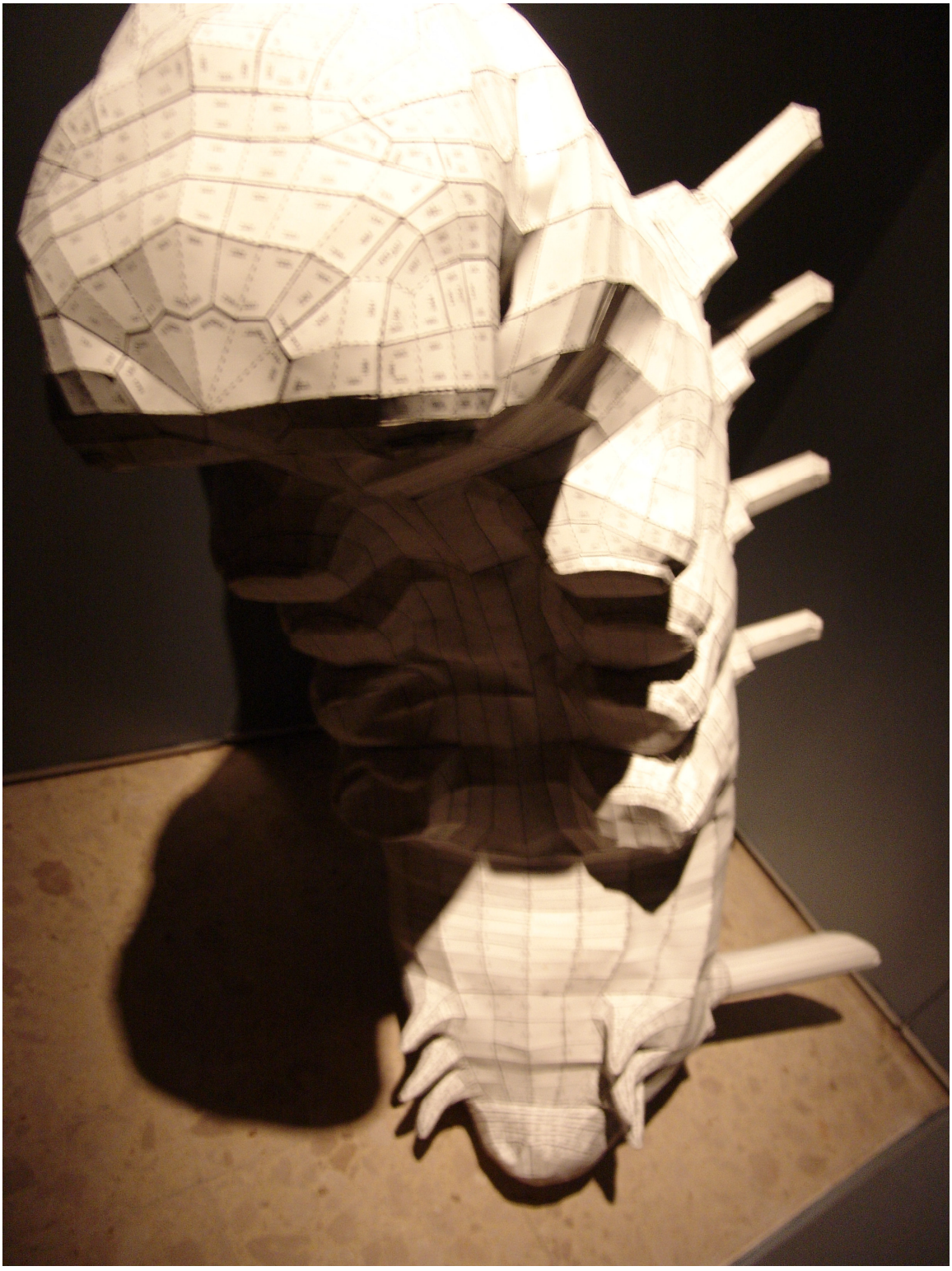

Figure 5 The Caterpillar (second version), Paper Craft

Figure 6 The Grasshopper, 3D Design

Figure 7 The Grasshopper, Paper Craft

Figure 8 The Grasshopper, Paper Craft

Figure 9 The Sitting Girl (first version), Charcoal Drawing

Figure 10 The Sitting Girl (second version), Watercolor Painting

Figure 11 The Sitting Girl (final version), Watercolor Painting

Figure 12 The Sitting Girl (first cancelled version), Paper Craft

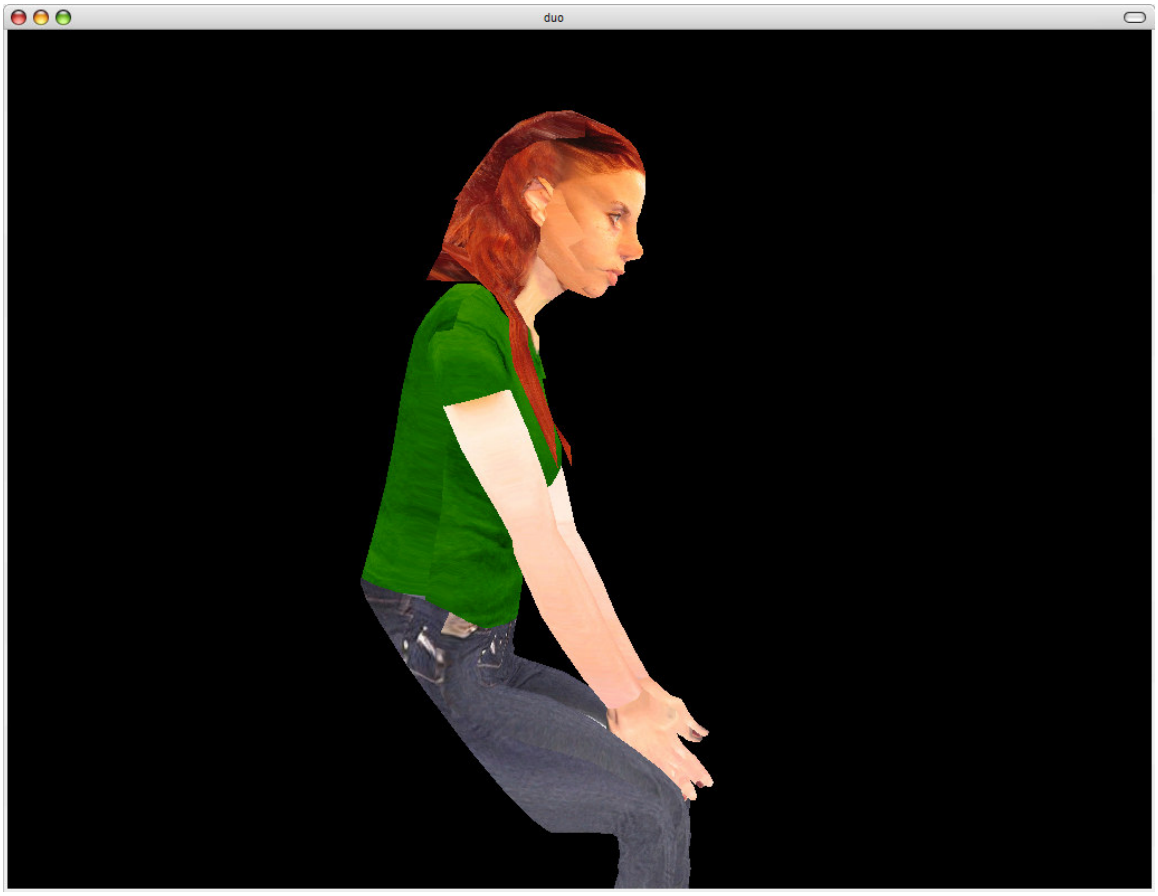

Figure 13 The Sitting Girl (second cancelled version), Interactive Projection

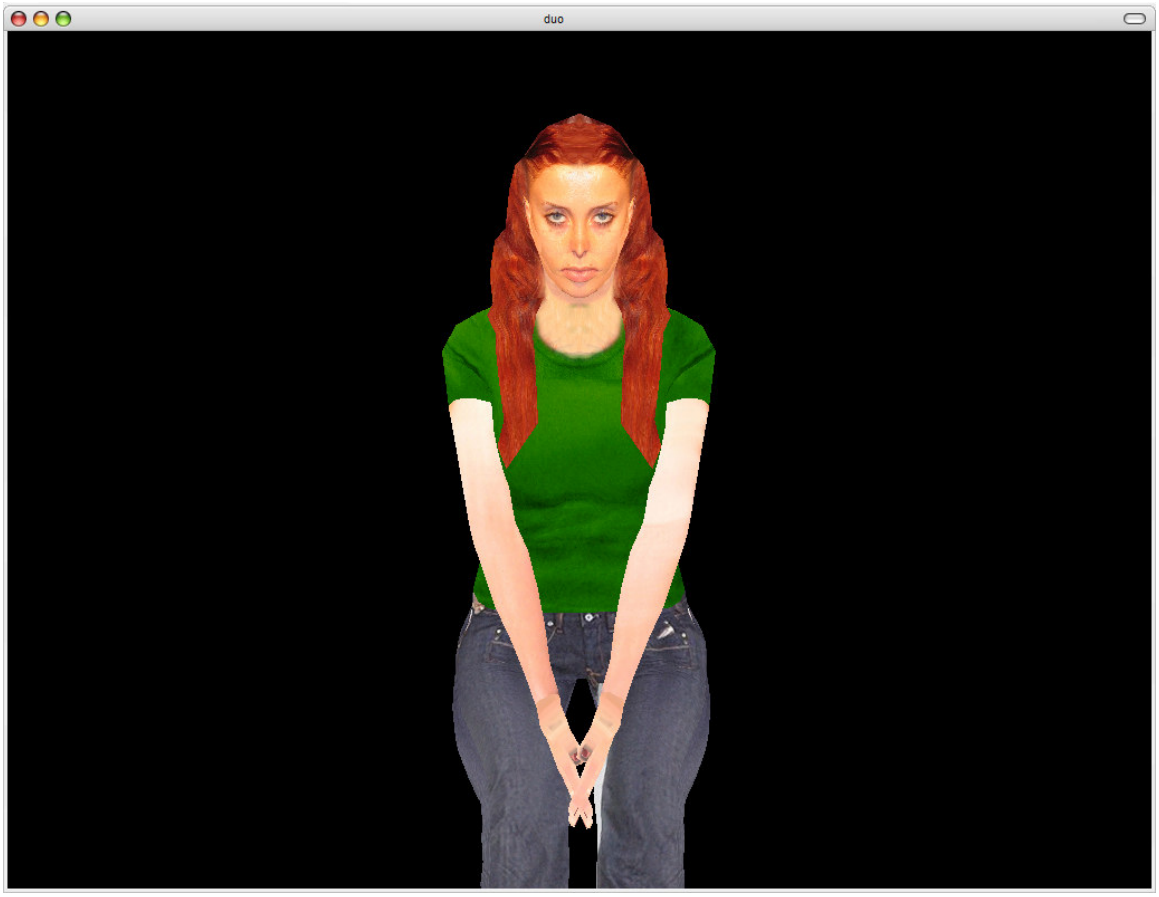

Figure 14 The Sitting Girl (second cancelled version), Interactive Projection

Figure 15 The Sitting Girl (final version), Projection

Figure 16The Sitting Girl, Installation

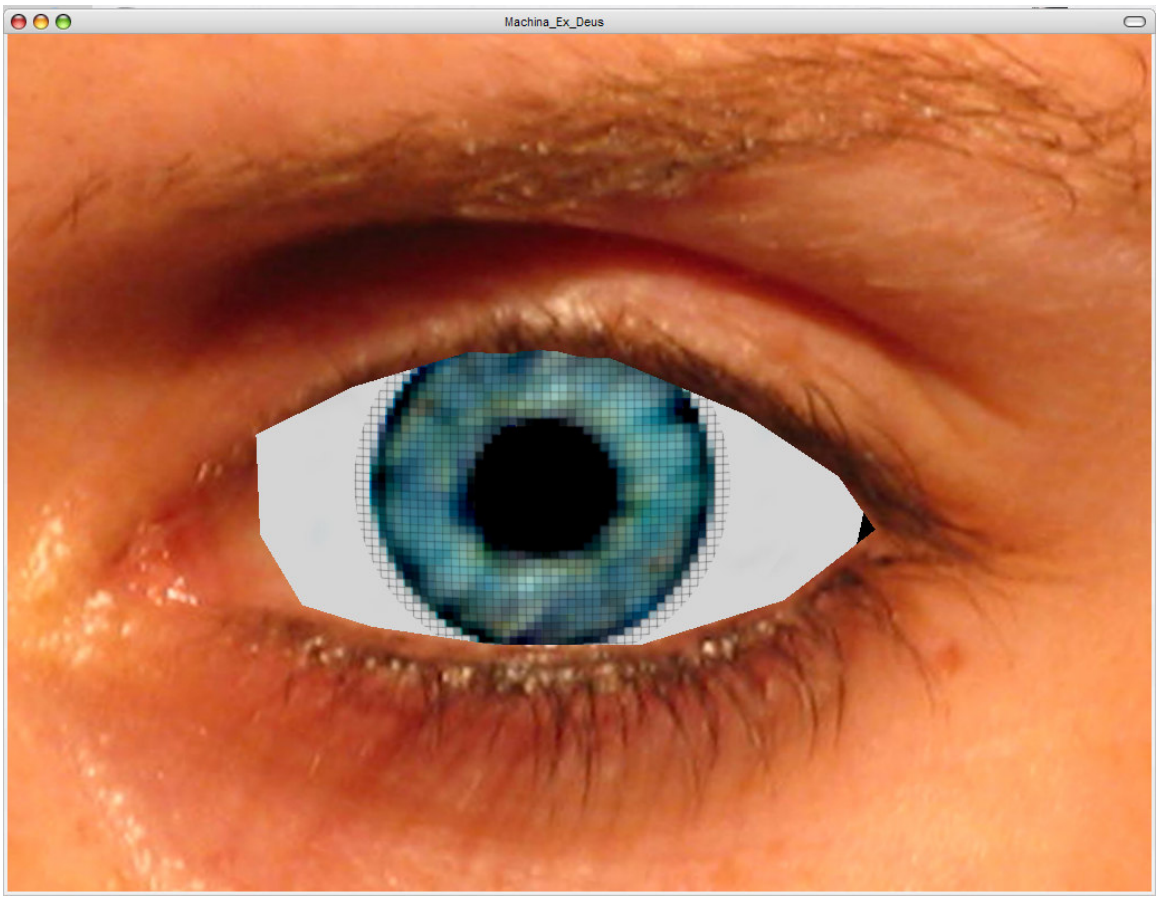

Figure 17 The All Seeing Eye (cancelled work), Interactive Projection

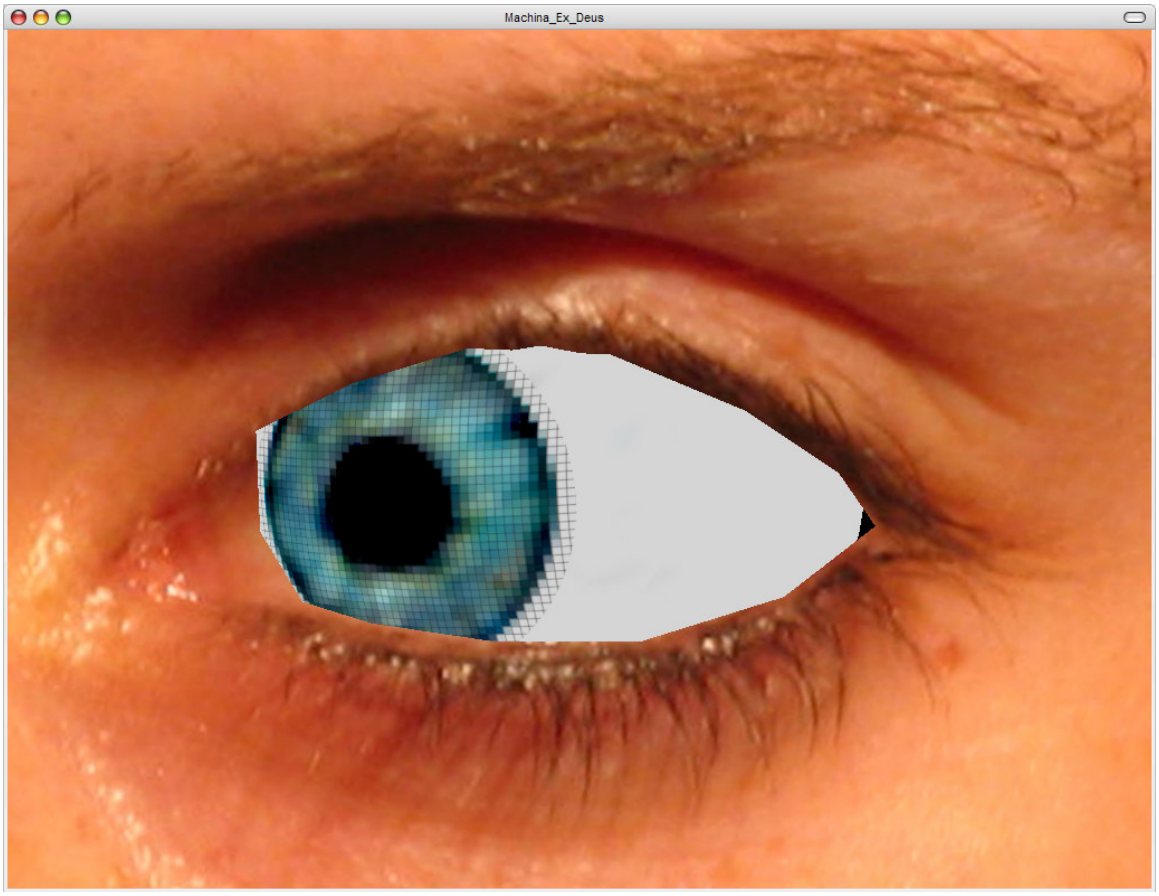

Figure 18 The All Seeing Eye (cancelled work), Interactive Projection

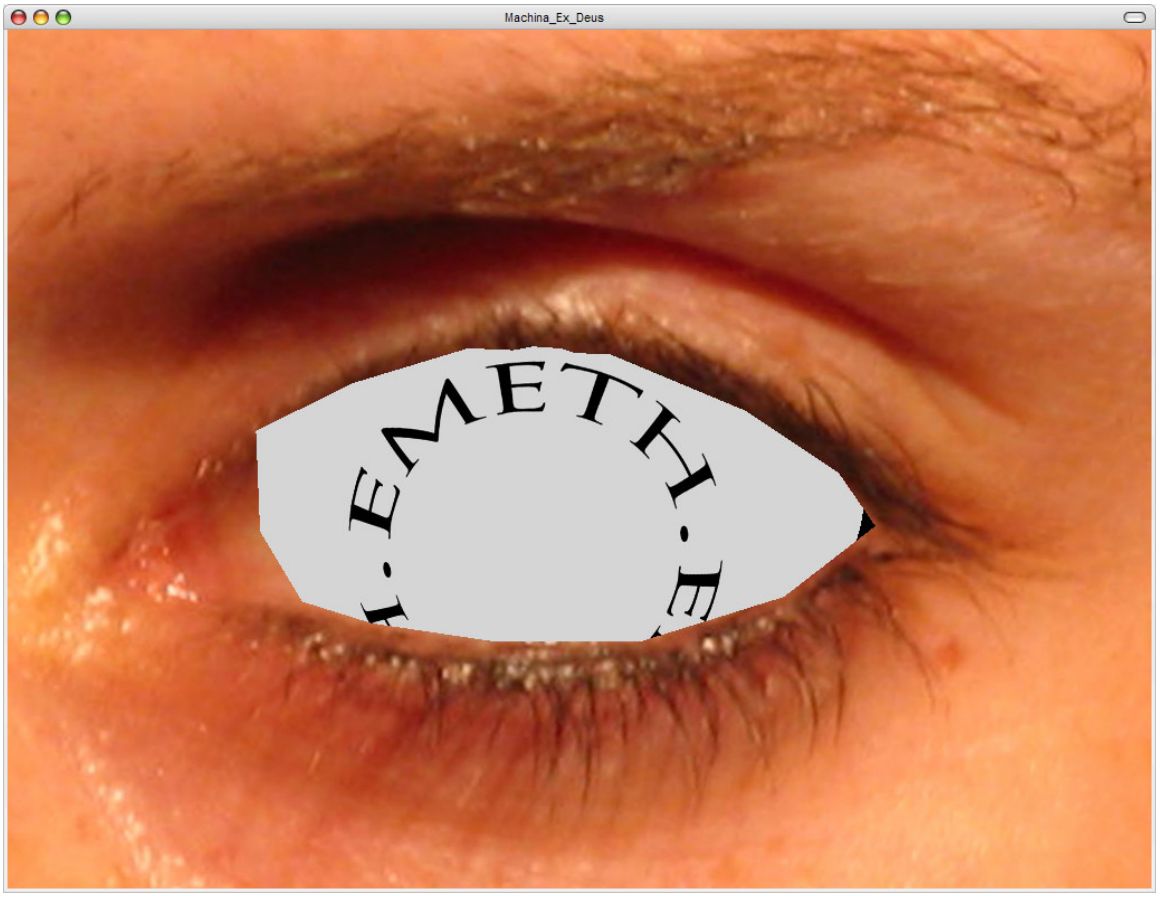

Figure 19 The All Seeing Eye (cancelled work), Interactive Projection

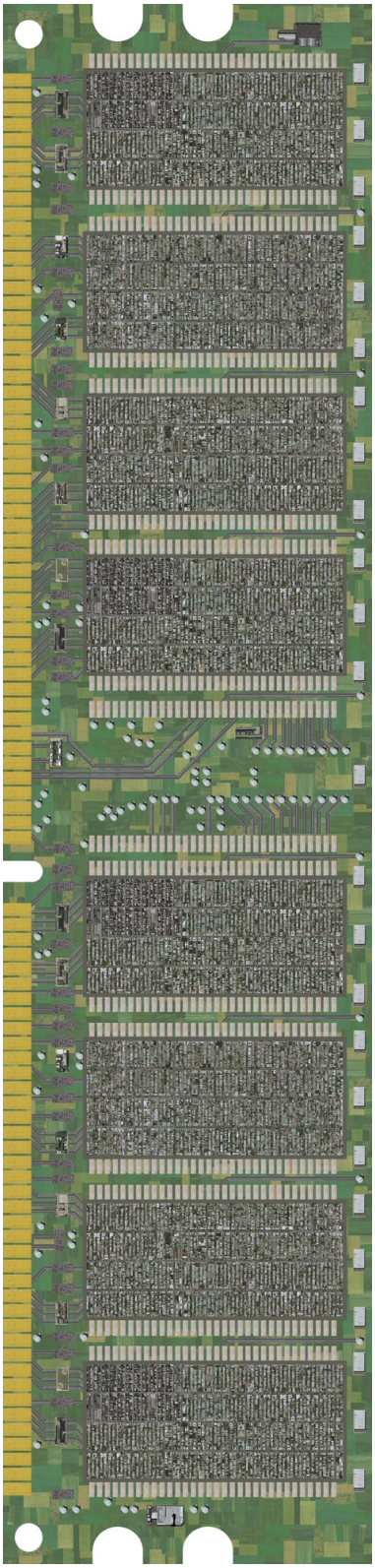

Figure 20 The RAM, Photoshop Collage

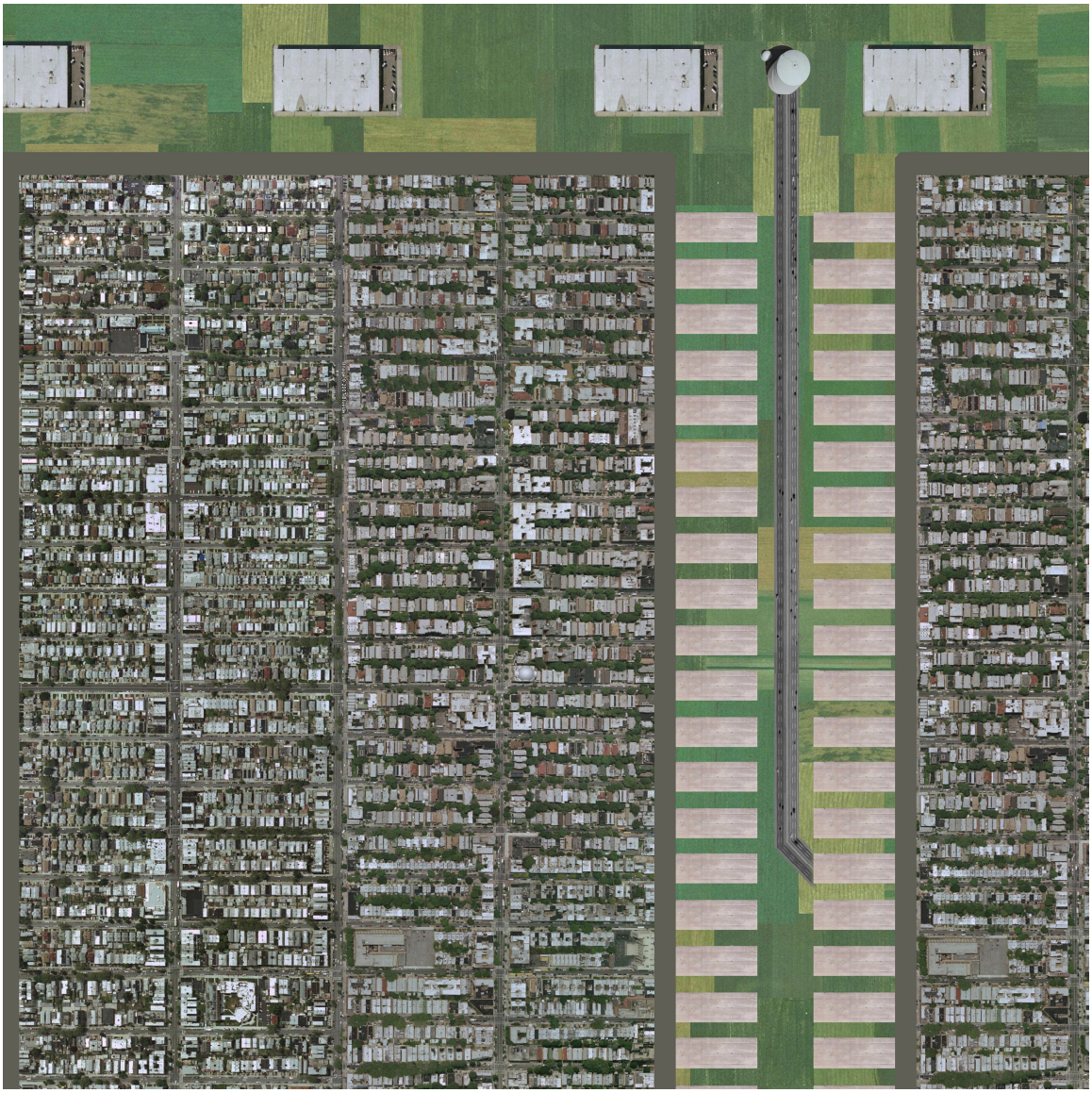

Figure 21 The RAM (detail), Photoshop Collage

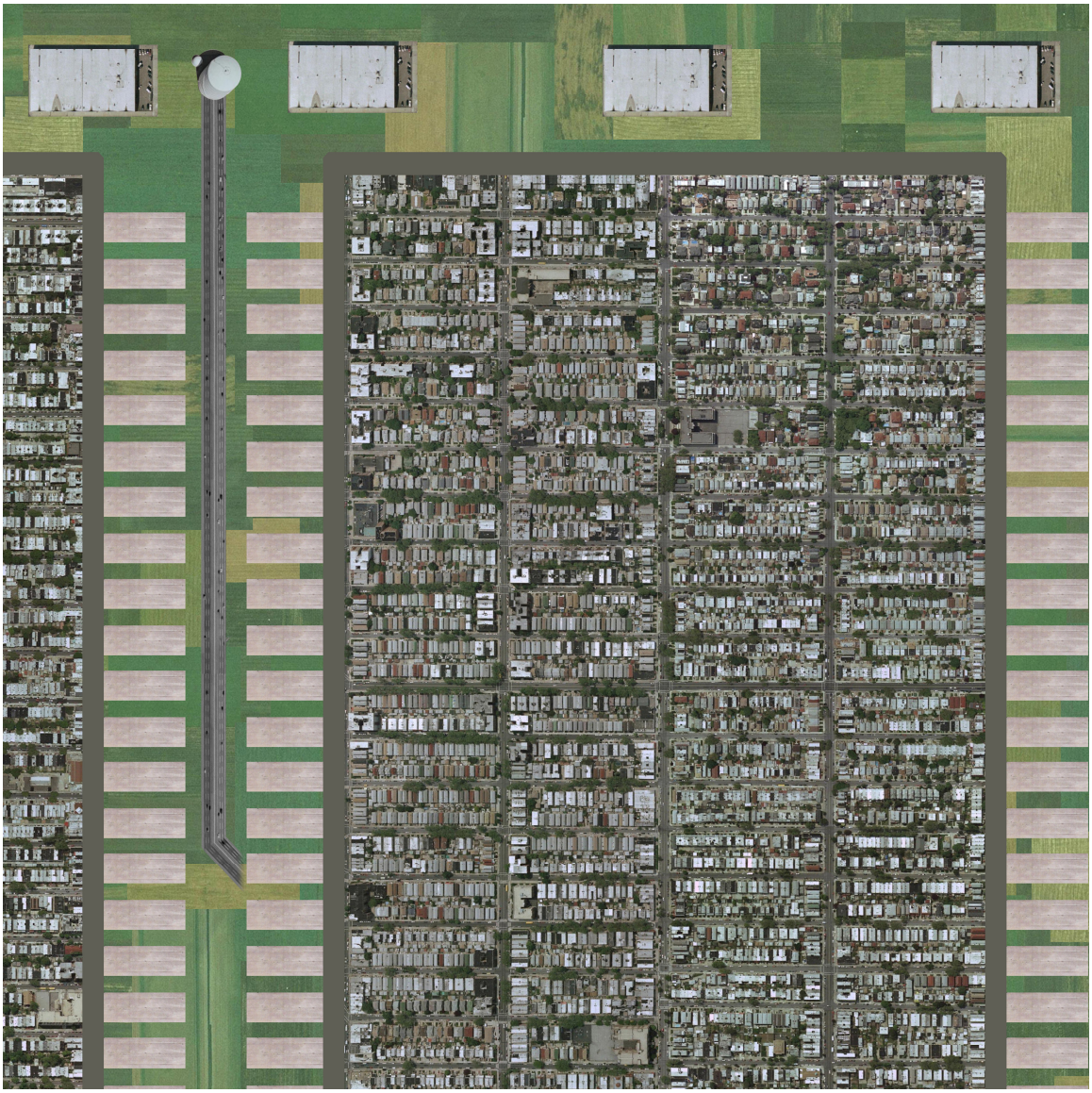

Figure 22 The RAM (detail), Photoshop Collage

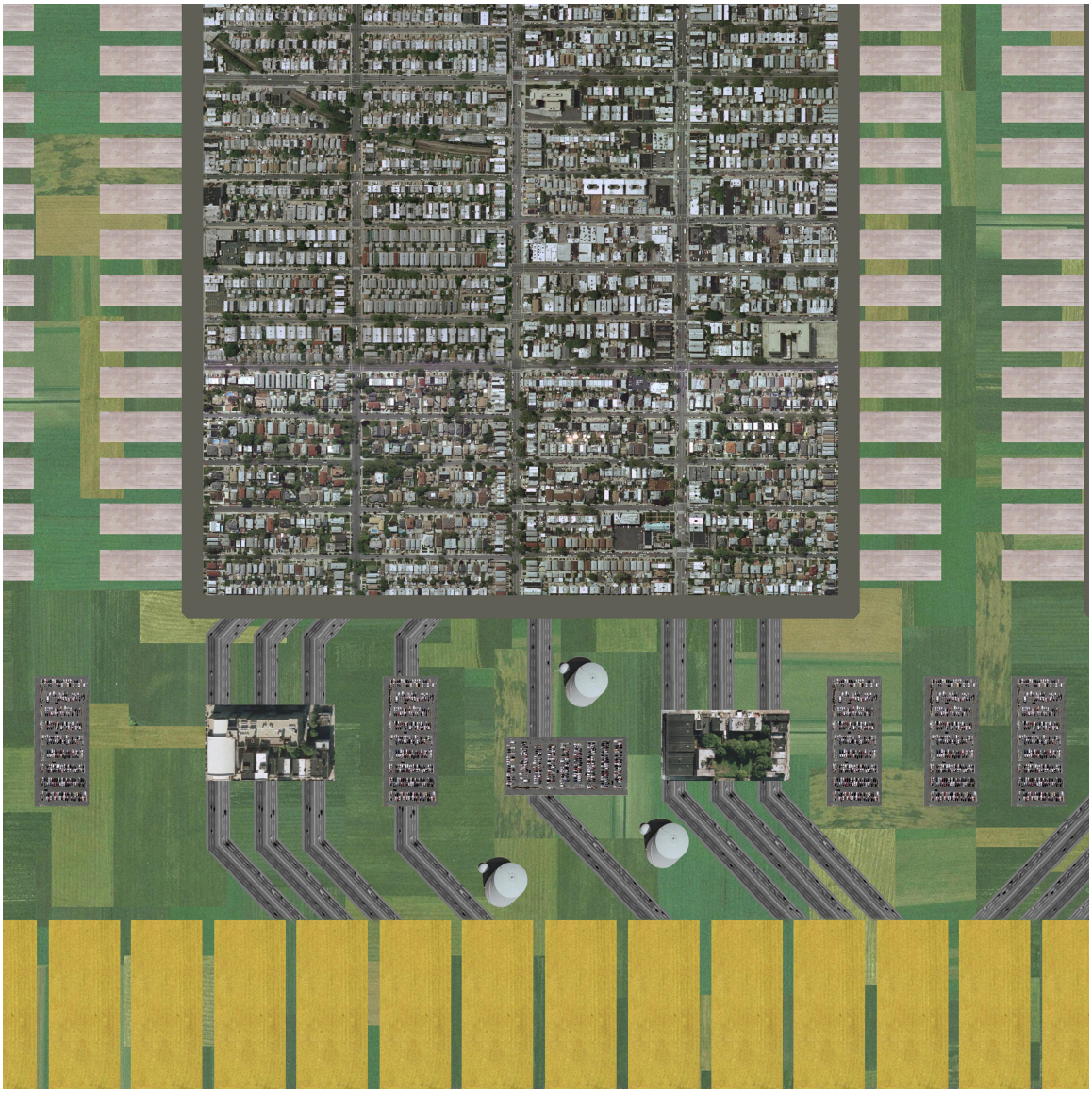

Figure 23 The RAM (detail), Photoshop Collage

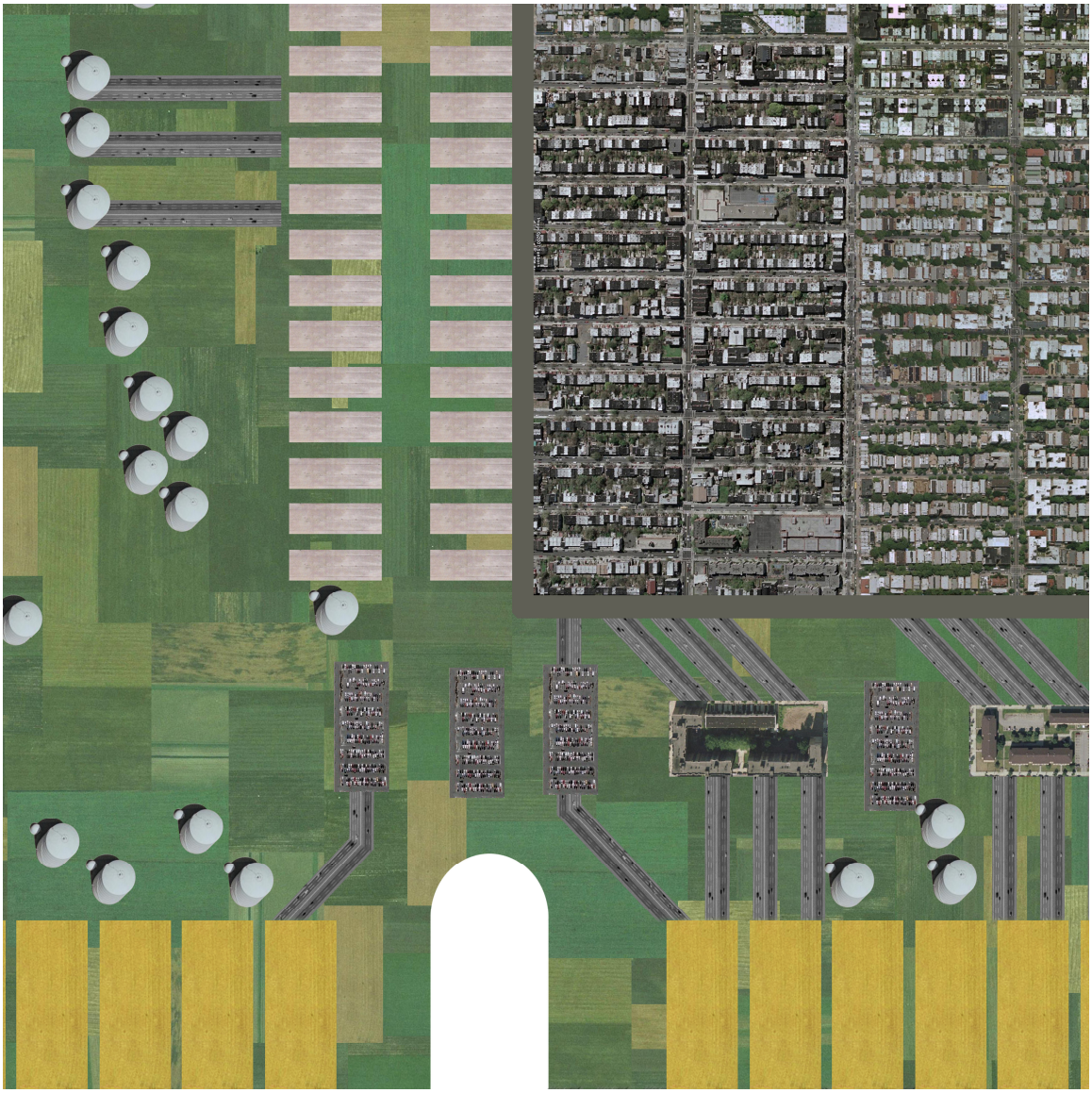

Figure 24 The RAM (detail), Photoshop Collage

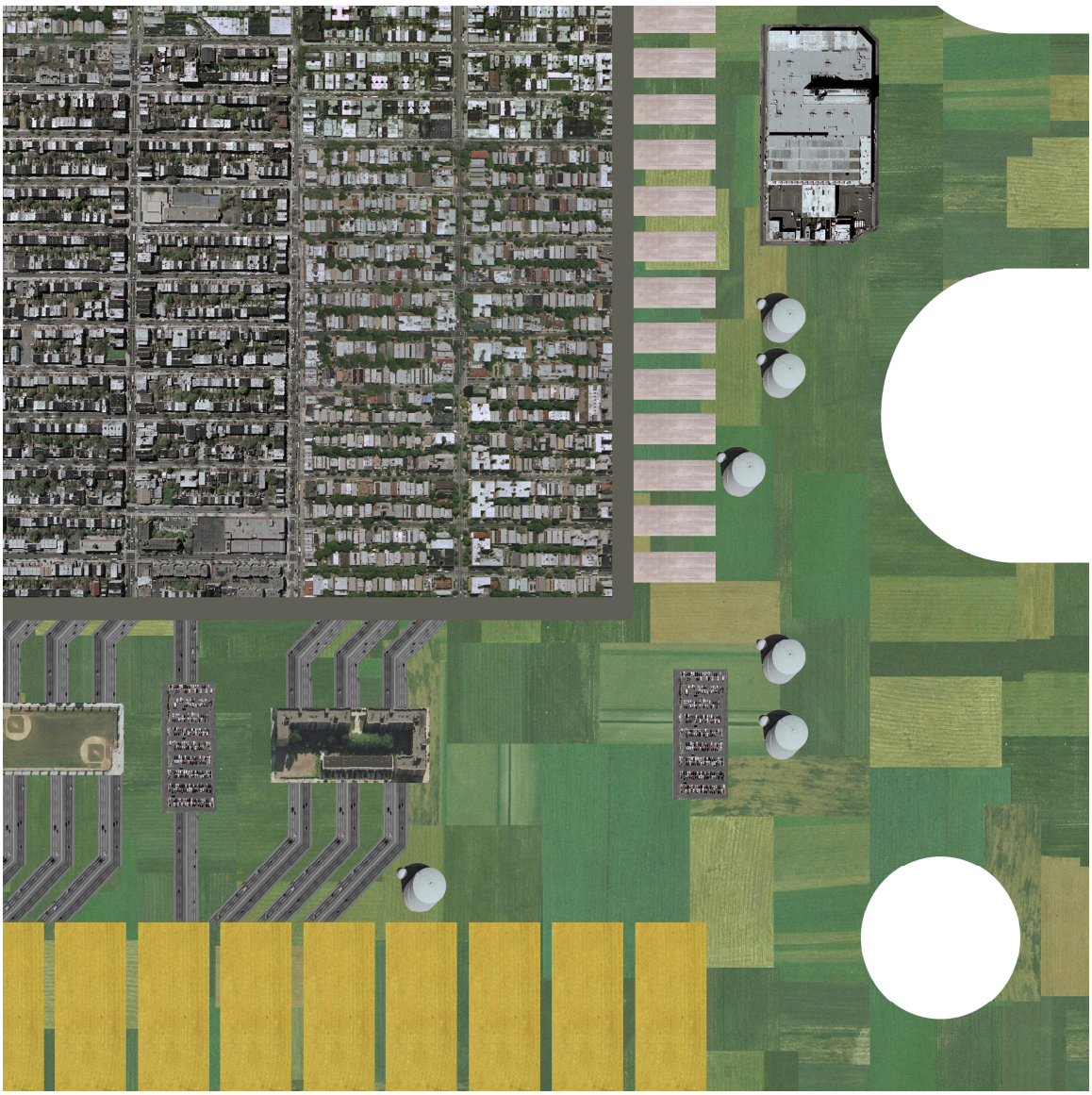

Figure 25 The RAM (detail), Photoshop Collage

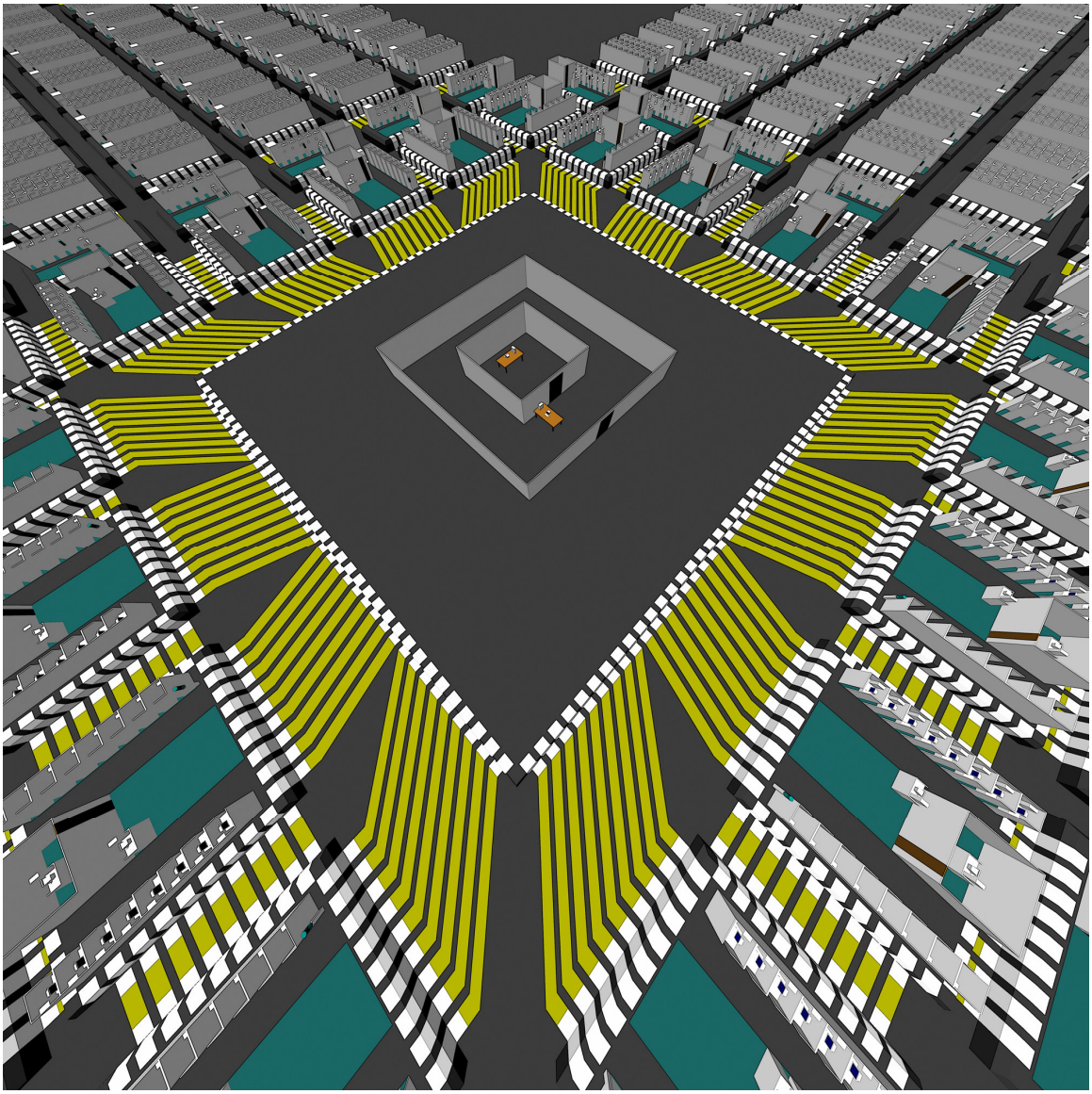

Figure 26 The Chip, Vector Graphics

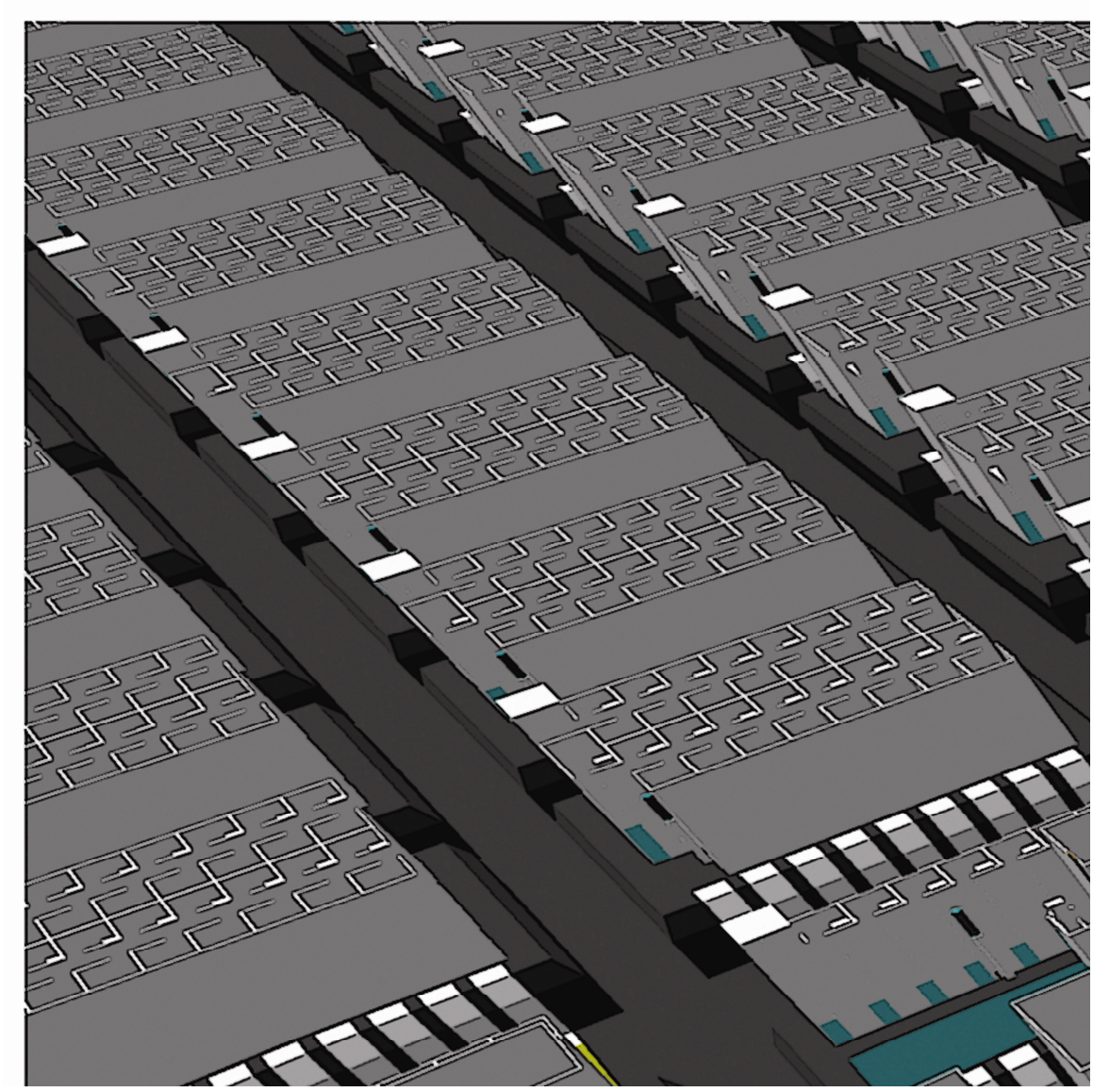

Figure 27 The Chip (detail), Vector Graphics

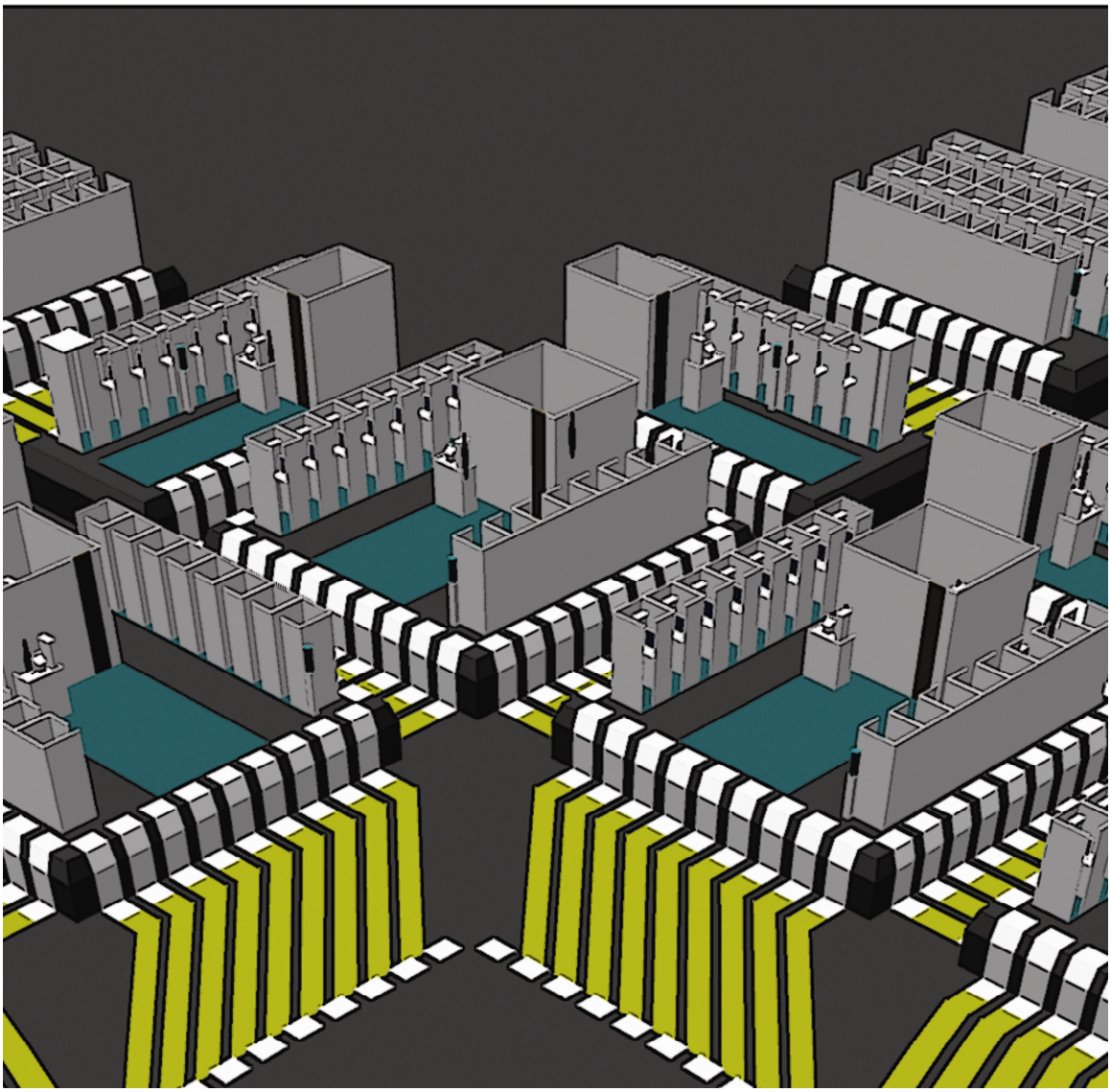

Figure 28 The Chip (detail), Vector Graphics

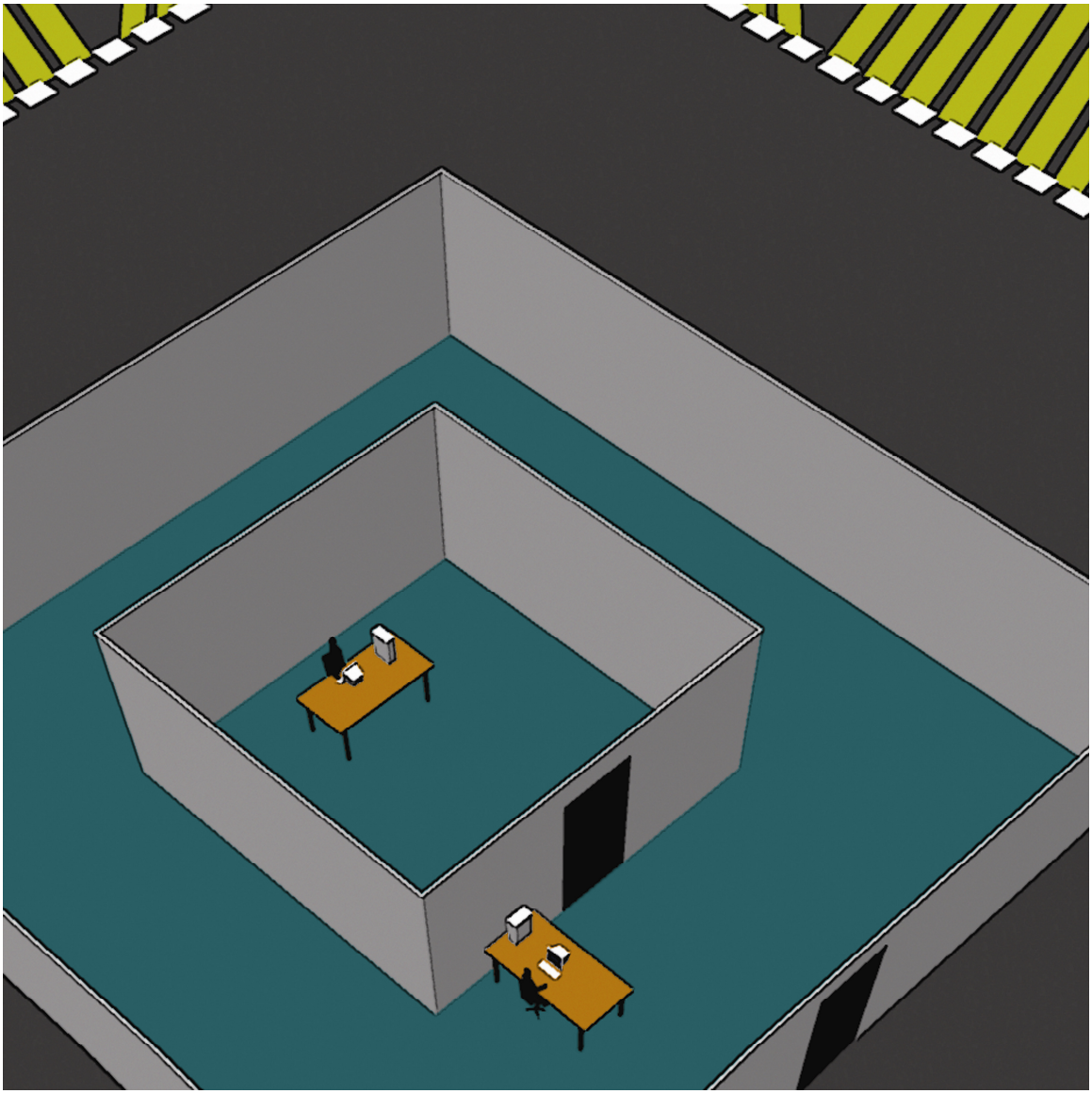

Figure 29 The Chip (detail), Vector Graphics

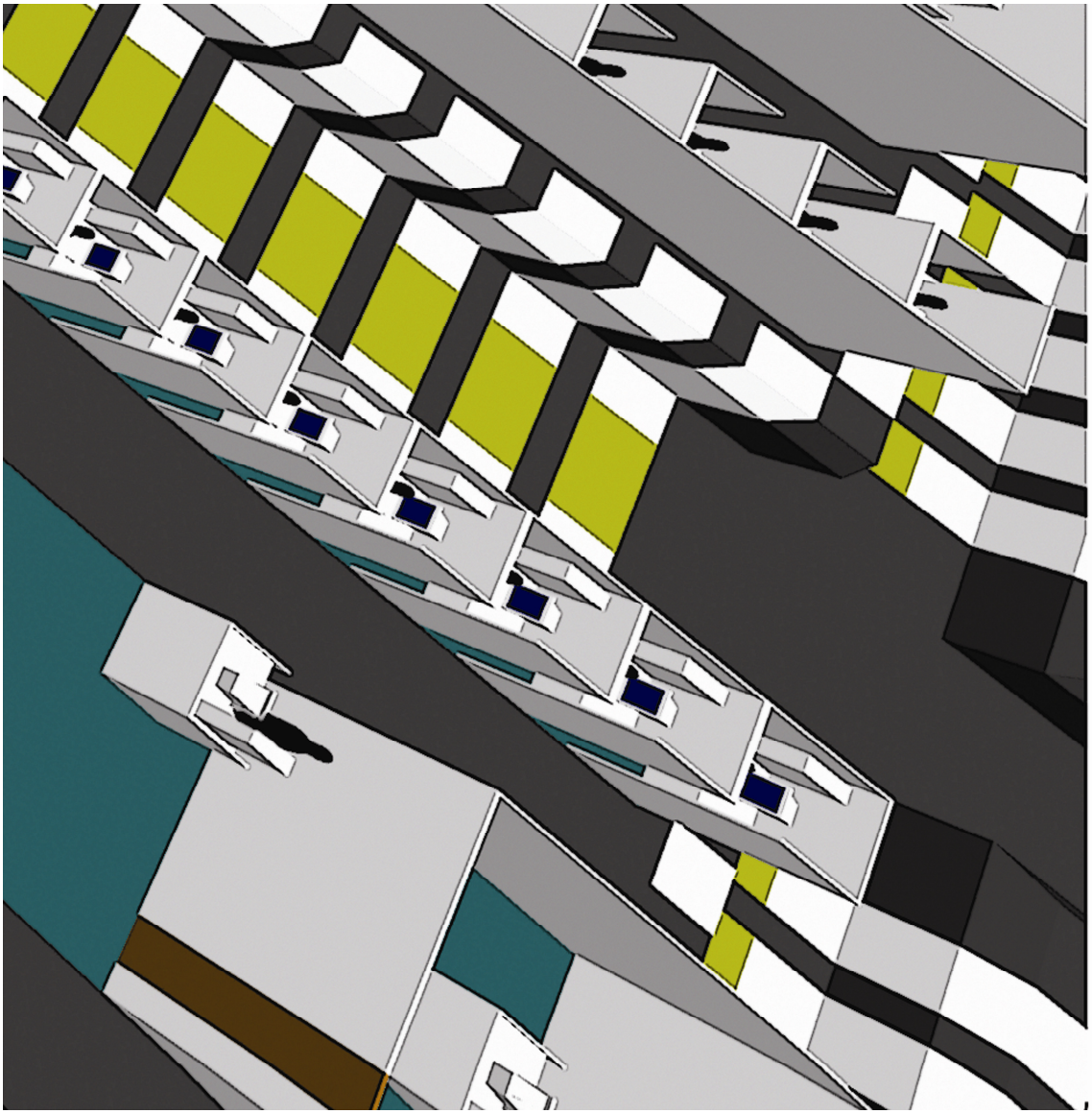

Figure 30 The Chip (detail), Vector Graphics

Figure 31 Exhibition

Figure 32 Exhibition

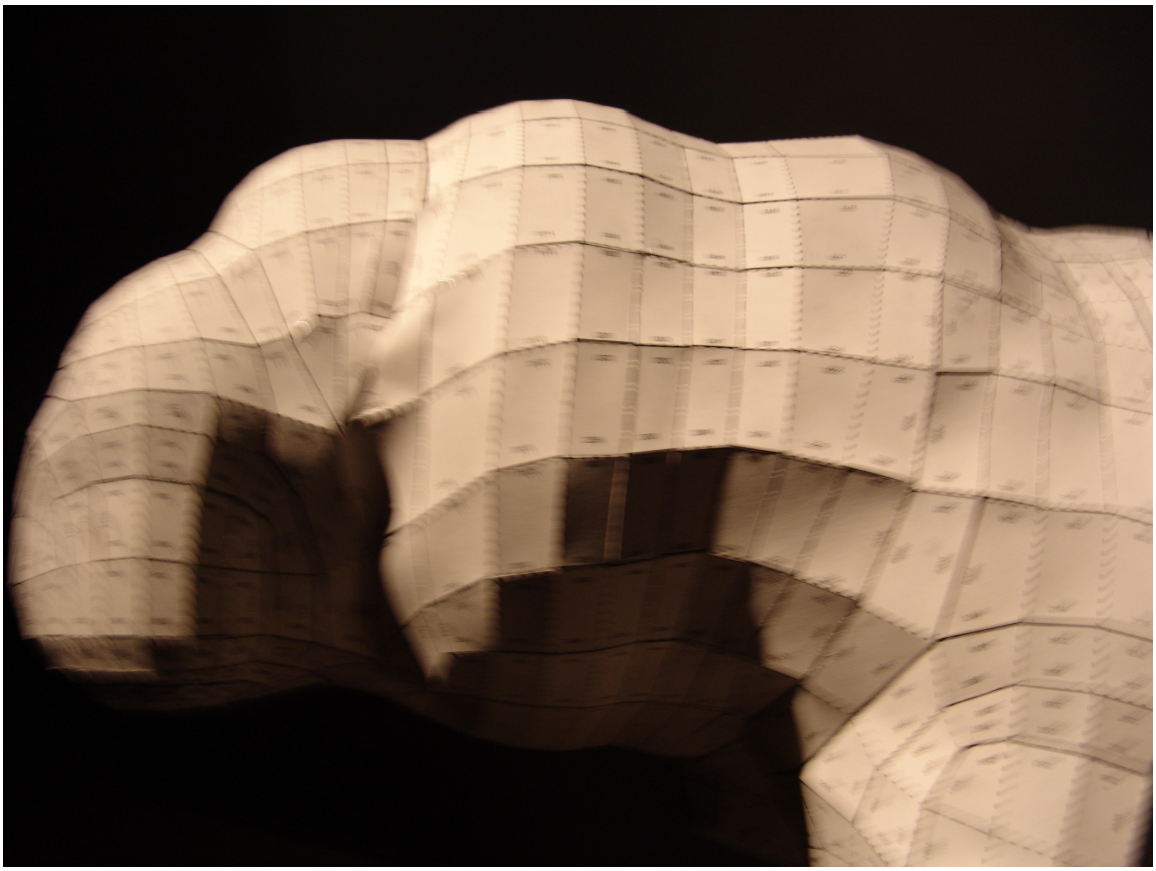

Figure 33 Exhibition

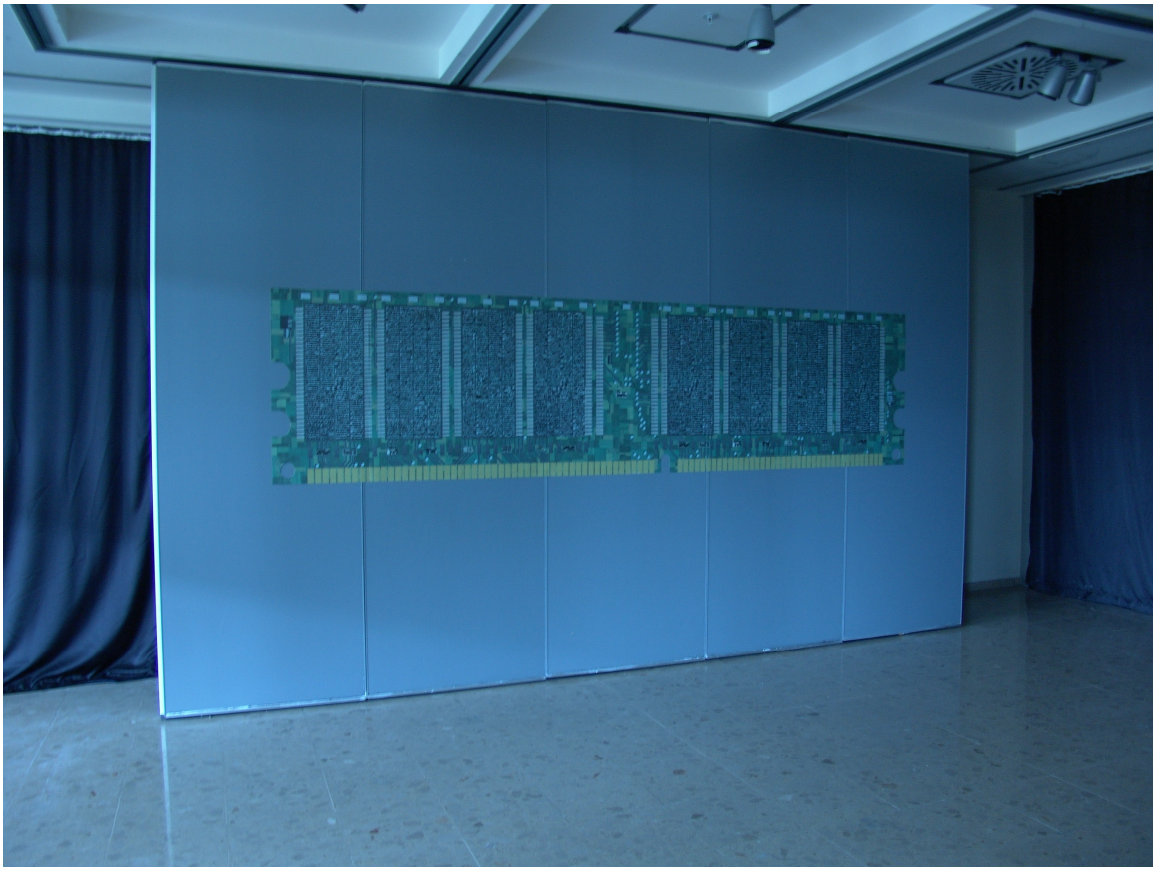

Figure 34 Exhibition

Figure 35 Exhibition

Figure 36 Exhibition

Figure 37 Invitation

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